

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P804819/WO/1</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/DE2005/000358</b>	International filing date ( <i>day/month/year</i> ) <b>03.03.2005</b>	Priority date ( <i>day/month/year</i> ) <b>26.03.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>H02M1/08, H02M1/084, H02M7/48, H02M7/5387</b>		
Applicant <b>MTU AERO ENGINES GMBH</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of _____ sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> ( <i>sent to the applicant and to the International Bureau</i> ) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> ( <i>sent to the International Bureau only</i> ) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2005/000358

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-6 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 1-12 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/2-2/2 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2005/000358

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	<u>1-12</u>	YES
	Claims	<u>-</u>	NO
Inventive step (IS)	Claims	<u>1-12</u>	YES
	Claims	<u>-</u>	NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims	<u>-</u>	NO
2. Citations and explanations (Rule 70.7)			
<p>1). Reference is made to the following documents:</p> <p>D1: US6404655</p> <p>D2: US2003090228</p> <p>D3: US2003063482</p>			
<p>2). D1, which is considered to be the closest prior art, discloses a:</p> <ul style="list-style-type: none"> <li>- circuit arrangement for drives, for providing or producing three-phase current with at least two driver stages, it being possible to actuate each driver stage by a pulse-width modulated input signal (figure 1), and in which</li> <li>- the driver stage or each driver stage (117) in figure 2 is connected preferably to a step-down actuator stage (50) in figure 3 in such a way that</li> <li>- when a first driver stage (117, Q2) is actuated a first switching device of a step-down actuator stage (Q2) actuates a low-pass device (50) of the step-down actuator stage, and that</li> <li>- when a second driver stage (117, Q1) is actuated a second switching device of the step-down actuator stage (Q1) actuates the low-pass device (50) of the step-down actuator stage (figures 1 and 3).</li> </ul>			

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>3). Differences between claim 1 and D1:</p> <ul style="list-style-type: none"><li>- production of a bipolar output DC signal as a function of a pulse-width modulated input signal.</li></ul> <p>4). D1 merely describes a filter circuit for suppressing power system reactions and presents for this purpose a suitable driver circuit without transformer. A person skilled in the art who wishes to perform quiet closed-loop control of the motor current in a drive, for example torque motor for auxiliary drives, in an aircraft would be little concerned with the power system harmonics from D1 and would therefore have no reason to connect an LC upstream of the engine but rather would use the conventional circuit from D2.</p> <p>D1 presents a regulated power system filter with a step-up converter (30) and three-phase current bridge (40). However, the present application describes a completely different circuit: a signal converter from PWM to analogue.</p> <p>Claim 1 therefore appears to be novel and inventive (PCT Article 33(2) and (3)).</p> <p>5). Claims 2-12 describe the connection of the components and therefore also appear to be novel and inventive (PCT Article 33(2) and (3)).</p>